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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,139	02/17/2004	Henry Bertoni	Poly-31	2250

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EXAMINER
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MULL, FRED H

ART UNIT	PAPER NUMBER
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3662

DATE MAILED: 05/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/780,139	<b>Applicant(s)</b> BERTONI ET AL.	
	<b>Examiner</b> Fred H. Mull	<b>Art Unit</b> 3662	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02/17/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.                                                |

5

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 1 and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In each claim, in part (b), direction-of-arrival (DOA) determination is listed as an option, but then part (c), DOA determination appears to be required.

Clarification is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-12, 14, 16-25, 42-44, 46, and 48-53 rejected under 35 U.S.C. 102(b) as being anticipated by Holt.

In regard to claims 1-10, 16-25, 42-43, and 48-53, Holt discloses accepting at an observation point (Rx<sub>1</sub>, Fig. 6), signals emanating from the object (64); determining, for each of the accepted signals, at least one of (A) an associated time of arrival, (B)

Art Unit: 3662

amplitude, and direction of arrival; determining at least two trace-back rays from the observation point using the direction of arrival of signals and topographical information; d) determining candidate locations at crossings of two or more trace-back rays; determining a set of final candidate locations from the determined candidate locations; and determining the location of the object of interest using the set of final candidate locations (§§ 68-75).

In regard to claim 11, Holt further discloses using all of an associated TOA, and amplitude, and a DOA (§§ 49).

In regard to claims 12, 14, 44, and 46, Holt further discloses the topographical information including sources of signal reflection and building surfaces (§§ 70-72).

3. Claims 1-11, 13-14, 16-25, 42-43, 45-46, and 48-53 rejected under 35 U.S.C. 102(b) as being anticipated by Wang.

In regard to claims 1-11, 16-25, 42-43, and 48-53, Wang discloses accepting at an observation point (32, Fig. 2), signals emanating from the object (12); determining, for each of the accepted signals, (28, 38) at least one of (A) an associated time of arrival, (B) amplitude, and direction of arrival; determining at least two trace-back rays from the observation point using the direction of arrival of signals and topographical information; d) determining candidate locations at crossings of two or more trace-back rays; determining a set of final candidate locations from the determined candidate locations; and determining the location of the object of interest using the set of final candidate locations (col. 8, line 16 to col. 11, line 15).

In regard to claims 13-14 and 45-46, Wang further discloses the topographical information including sources of diffraction and building surfaces (28, 36, Fig. 2; col. 7, lines 7-14).

4. Claims 1-12, 14, 16-25, 42-44, 46, and 48-53 rejected under 35 U.S.C. 102(b) as being anticipated by Thomas.

In regard to claims 1-10, 16-25, 42-43, and 48-53, Thomas discloses accepting at an observation point (MS, Fig. 1), signals emanating from the object (BS); determining, for each of the accepted signals,  $(r_{n,m}, r_m)$  at least one of (A) an associated time of arrival, (B) amplitude, and direction of arrival; determining at least two trace-back rays from the observation point using the direction of arrival of signals and topographical information; d) determining candidate locations at crossings of two or more trace-back rays; determining a set of final candidate locations from the determined candidate locations; and determining the location of the object of interest using the set of final candidate locations (p. 1193-1194).

In regard to claim 11, Thomas further discloses using all of an associated TOA, and amplitude, and a DOA (abstract).

In regard to claims 12, 14, 44, and 46, Thomas further discloses the topographical information including sources of signal reflection and building surfaces (p. 1193, Introduction, 2<sup>nd</sup> ¶).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 13, 15, 45, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holt in view of either one of Katsriku and Jenn.

Holt discloses the topographical information including sources of signal reflection and refraction (§§ 70-72). Holt fails to disclose diffraction and attenuation. However, it is well known that electromagnetic signals are affected by the processes of diffraction and attenuation as well as reflection and refraction.

Katsriku discloses that electromagnetic signals for use in wireless communication are affected by attenuation, reflection, diffraction, refraction, scattering, etc. (p. 2-4).

Jenn discloses that electromagnetic signals for use in wireless communication are affected by reflection, refraction, diffraction, attenuation, scattering, and depolarization (Overview of Electromagnetic Wave Propagation, p. 1).

It would have been obvious to include all the electromagnetic effects that affect wireless communication signals in order to calculate an accurate emitter source location.

6. Claims 12, 15, 44, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of either one of Katsriku and Jenn.

Wang discloses the topographical information including sources of signal diffraction (28, 36, Fig. 2; col. 7, lines 7-14). Wang fails to disclose reflection and attenuation. However, it is well known that electromagnetic signals are affected by the processes of reflection and attenuation as well as diffraction.

Katsriku discloses that electromagnetic signals for use in wireless communication are affected by attenuation, reflection, diffraction, refraction, scattering, etc. (p. 2-4).

Jenn discloses that electromagnetic signals for use in wireless communication are affected by reflection, refraction, diffraction, attenuation, scattering, and depolarization (Overview of Electromagnetic Wave Propagation, p. 1).

It would have been obvious to include all the electromagnetic effects that affect wireless communication signals in order to calculate an accurate emitter source location.

7. Claims 13, 15, 45, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas in view of either one of Katsriku and Jenn.

Thomas discloses the topographical information including sources of signal reflection and refraction (p. 1193, Introduction, 2<sup>nd</sup> ¶). Thomas fails to disclose diffraction and attenuation. However, it is well known that electromagnetic signals are affected by the processes of diffraction and attenuation as well as reflection and refraction.

Katsriku discloses that electromagnetic signals for use in wireless communication are affected by attenuation, reflection, diffraction, refraction, scattering, etc. (p. 2-4).

Jenn discloses that electromagnetic signals for use in wireless communication are affected by reflection, refraction, diffraction, attenuation, scattering, and depolarization (Overview of Electromagnetic Wave Propagation, p. 1).

It would have been obvious to include all the electromagnetic effects that affect wireless communication signals in order to calculate an accurate emitter source location.

8. Claims 26-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one of Holt, Wang, and Thomas and in further view of Tweg.

Holt, Wang, and Thomas fail to disclose using cardinality to distinguish between sets of possible location solutions.

Tweg discloses a DOA positioning system that uses the cardinality of a set of possible location solutions in order to determine the most probable location among them (col. 10, lines 35-60).

It would have been obvious to use the known cardinality method of Tweg to determine the most probable location for the object in Holt, Wang, or Thomas.

9. The examiner also finds the following reference(s) relevant:

Sen, which discusses the cardinality method in more detail.

Applicant is encouraged to consider these documents in formulating their response (if one is required) to this action, in order to expedite prosecution of this application.




Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred H. Mull whose telephone number is 571-272-6975. The examiner can normally be reached on M-F 9:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas H. Tarcza can be reached on 571-272-6979. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Fred H. Mull  
Examiner  
Art Unit 3662

fhm

  
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